

TEST REPORT

Laboratory ID

MOTOROLA PPG, Compliance Laboratory
1500 Gateway Boulevard
Boynton Beach, FL 33426-8292
PH (561)-739-2179 FAX (561)-739-2131

Submitter ID

Motorola Inc.
1500 Gateway Boulevard
Boynton Beach, FL 33426

Report Issue Date: **January 25, 2001**

Sample S / N: 30CKAG2229

Test Report Number: 00001A

Model Designation: VHF Scriptor Jazz

200

Sample Receipt Date: January 23, 2001

Date: January 25, 2001

Product Description: Paging Receiver

Description of non-standard test method or practice: N / A

Estimated Measurement Uncertainty: +/- 3.2 dB for 95% confidence

Special limitations of use: N / A

Traceability: ***reference standards of measurement have been calibrated by a competent laboratory using standards traceable to the NIST.***

According to the tests performed at MOTOROLA PPG, Compliance Laboratory, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Manager, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature: John Freeman

Name: John Freeman

Title: Compliance Program Manager

Date : _____

Reviewed by:

Approved Signatory: Edwin Mendivil

Date: Jan. 30, 2001

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THIS REPORT MUST NOT BE USED TO CLAIM PRODUCT ENDORSEMENT BY NVLAP OR ANY AGENCY OF THE U.S. GOVERNMENT

MOTOROLA PPG, Compliance Laboratory
Paging Products Group
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EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to the following regulations:

- ◇ - EN 55022 : 1994 / A1:1995
- ◇ - Class A
- ◇ - Class B
- ◆ - FCC Part 15
- ◇ - Class A
- ◆ - Class B
- ◆ - Certification
- ◇ - Notification
- ◇ - Verification
- ◇ - Declaration of Conformity
- ◇ - FCC Part 24
- ◇ - Transmitter Spurious Emissions
- ◇ - EIRP
- ◇ - Occupied Bandwidth
- ◇ - IEC 1000-4-3
- ◇ - Radiated Immunity

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Environmental Conditions During Testing :

	LAB	OATS
Temperature:	<u>78 deg. F</u>	<u>75 deg. F</u>
Relative Humidity:	<u>60 – 70%</u>	<u>60 - 70%</u>
Atmospheric Pressure:	<u> </u>	<u> </u>
Power Supply System: phase	: <u> </u> Volts <u> </u> Hz <u> </u>	

Internal Battery Operated @ 1.5 Volts

Sign Explanations:

◇ - not applicable

◆ - applicable

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *Conducted Emissions (Interference Voltage)* measurements were performed at the following test location:

- ◆ - **Test not applicable** EUT DC Powered
- ◇ - Boynton Open Area Test Site
- ◇ - Boynton Compliance Laboratory

Test equipment used:

Model Number	Manufacturer	Description	Serial Number
◇ - 8566B	Hewlett Packard	Spec. Analyzer	3014A06961
◇ - 85650A	Hewlett Packard	Quasi-Pk Adaptor	2521A00671
◇ - 8593EM	Hewlett Packard	EMC Analyzer	3536A00118

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *Radiated Emissions (Magnetic Field)* measurements were performed at the following test location:

- ◆ - **Test not applicable**
- ◇ - Boynton Open Area Test Site
- ◇ - Boynton Compliance Laboratory

at a test distance of:

- ◇ - 3 meters
- ◇ - 10 meters

Test equipment used:

Model Number	Manufacturer	Description	Serial Number
◇ - B-100	Compliance Design, Inc.	Bio-Rad Antenna	385
◇ - 8566B	Hewlett Packard	Spec. Analyzer	3014A06961
◇ - 85650A	Hewlett Packard	Quasi-PK Adaptor	2521A00671

◇ - 85685A	Hewlett Packard	Rf Preselector	2510A00192
◇ - 8447D	Hewlett Packard	Preamplifier	2944A07577

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Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *Radiated Emissions (Electric Field)* measurements, in the frequency range of 30 MHz - 1000 MHz, were tested in the vertical and horizontal polarization at the following test location:

- ◇ - **Test not applicable**
- ◇ - Boynton Open Area Test Site
- ◆ - Boynton Compliance Laboratory (GTEM!)

at a test distance of:

- ◆ - 3 meters
- ◇ - 10 meters

Test equipment used:

Model Number Number	Manufacturer	Description	Serial
◆ - 5305	EMCO	GTEM Cell	1135
◇ - 3147	EMCO	Log Periodic Antenna	9311-1124
◇ - B-100	Compliance Design	Biconical Antenna	385
◇ - SAS-200/571	AH SYSTEMS	Dual Ridge Horn Ant.	265
◇ - 8566B	Hewlett Packard	Spec. Analyzer	3014A06961
◇ - 85650B	Hewlett Packard	Quasi-Pk Adaptor	2521A00671
◇ - 85685A	Hewlett Packard	Rf Preselector	2510A00192
◇ - 8447D	Hewlett Packard	Preamplifier	2944A07577
◇ - 8347A	Hewlett Packard	Preamplifier	3307A01225
◇ - 8449B	Hewlett Packard	Preamplifier	3008A00535
◆ - 83006A	Hewlett Packard	Preamplifier	3950M00131
◆ - 8593 EM	Hewlett Packard	EMI Analyzer	3536A00118

Emissions Test Conditions: INTERFERENCE POWER

The *Interference Power* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location:

- ◆ - **Test not applicable**
- ◇ - Boynton Compliance Laboratory

Test equipment used:

Model Number Number	Manufacturer	Description	Serial
◇ - 8593EM	Hewlett Packard	EMI Analyzer	3536A00118

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◇ - 8347A	Hewlett Packard	Preamplifier	3307A01225
◇ - 8447D	Hewlett Packard	Preamplifier	2944A07577
◇ - 8449B	Hewlett Packard	Preamplifier	3008A00535

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Emissions Test Conditions: EQUIVALENT RADIATED EMISSIONS

The *Radiated Emissions (Electric Field)* measurements, in the frequency range of 1 GHz - 5 GHz, were tested in the vertical and horizontal polarization at the following test location:

- ◇ - **Test not applicable**
- ◇ - Boynton Open Area Test Site
- ◆ - Boynton Compliance Laboratory (GTEM!)

at a test distance of:

- ◆ - 3 meters
- ◇ - 10 meters

Test equipment used:

Model Number Number	Manufacturer	Description	Serial
◆ - 5305	EMCO	GTEM Cell	1135
◇ - 3147	EMCO	Log Periodic Antenna	9311-1124
◇ - SAS-200/571	AH SYSTEMS	Dual Ridge Horn Ant.	265
◇ - 8566B	Hewlett Packard	Spec. Analyzer	3014A06961
◇ - 8347A	Hewlett Packard	Preamplifier	3307A01225
◇ - 8449B	Hewlett Packard	Preamplifier	3008A00535
◆ - 83006A	Hewlett Packard	Preamplifier	3950M00131
◆ - 8593 EM	Hewlett Packard	EMI Analyzer	3536A00118
◇ - 85685A	Hewlett Packard	Rf Preselector	2510A00192

Equipment Under Test (EUT) Test Operation Mode - Emission Tests :

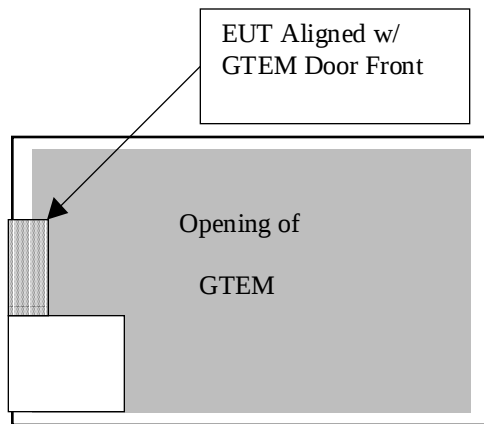
The device under test was operated under the following conditions during emissions testing:

- ◇ - Standby
- ◇ - Test pattern (H-Pattern)
- ◇ - Test program (color bar)
- ◇ - Test program (customer specific)
- ◇ - Practice operation
- ◆ - Normal operating mode

Configuration of the device under test :

- ◆ - EUT placed on a styrofoam block and aligned with the front vertical edge of the GTEM opening. The height of the EUT is such that its middle is exactly halfway between the septum and the GTEM floor.

BLOCK DIAGRAM OF TEST SETUP



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Test Results:

Conducted Emissions at 10/150/450 kHz - 30 MHz

The requirements are	◇ - MET		◇ - NOT MET
Minimum limit margin	_____ dB	at	_____ MHz
Minimum limit exceeded	_____ dB	at	_____ MHz

Remarks:

Radiated Emissions (Magnetic Field) 10 kHz - 30 MHz

The requirements are	◇ - MET		◇ - NOT MET
Minimum limit margin	_____ dB	at	_____ MHz
Minimum limit exceeded	_____ dB	at	_____ MHz

Remarks:

Radiated Emissions (electric field) 30 MHz - 1000 MHz

The requirements are	◆ - MET		◇ - NOT MET
Minimum limit margin	_____ 16.8 dB	at	_____ 149.9 MHz
Minimum limit exceeded	_____ dB	at	_____ MHz

Remarks:

Limit compared to readings taken utilizing quasi-peak detection.

Interference Power at the mains and interface cables 30 MHz - 300 MHz

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The requirements are

◇ - MET

◇ - NOT MET

Minimum limit margin

_____ dB

at

_____ MHz

Minimum limit exceeded

_____ dB

at

_____ MHz

Remarks:

Radiated Emissions 1 GHz - 5 GHz**The requirements are**

◆ - MET

◇ - NOT MET

Minimum limit margin

_____ dB

at

_____ MHz

Minimum limit exceeded

_____ dB

at

_____ MHz

Remarks: No emissions were detected In the range from 1 GHz to 5GHz.

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GENERAL REMARKS:

The EUT was measured at the GTEM in the Compliance Laboratory located at the address of the MOTOROLA PPG Compliance Laboratory noted on page 1 of this report.

The unit was pre-scanned in the GTEM cell and one emission was detected. The levels of local ambient signals were well within normal readings, therefore the system was operating properly.

There was no need for verification of the EUT at the open area test site due past correlation on the range showing the GTEM to report higher at these frequencies.. The GTEM cell has been correlated to the open area test site and has been accepted for testing by the FCC and Industry Canada.

The data in this report represents the worst case emissions detected from this EUT.

No modifications to this unit were necessary for it to pass the applicable limits of the technical regulations.

SUMMARY:

The requirements according to the technical regulations are:

◆ - MET

◇ - NOT Met

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The device under test does 1500 Gateway Blvd., Boynton Beach, Florida 33426
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- ◆ - fulfill the general approval requirements mentioned on page 3.
- ◇ - not fulfill the general approval requirements mentioned on page 3.

Testing Start Date **January 24, 2001**

Testing End Date **January 24, 2001**

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Test-Setup Photo(s):

Conducted emission 450 / 150 kHz - 30 MHz

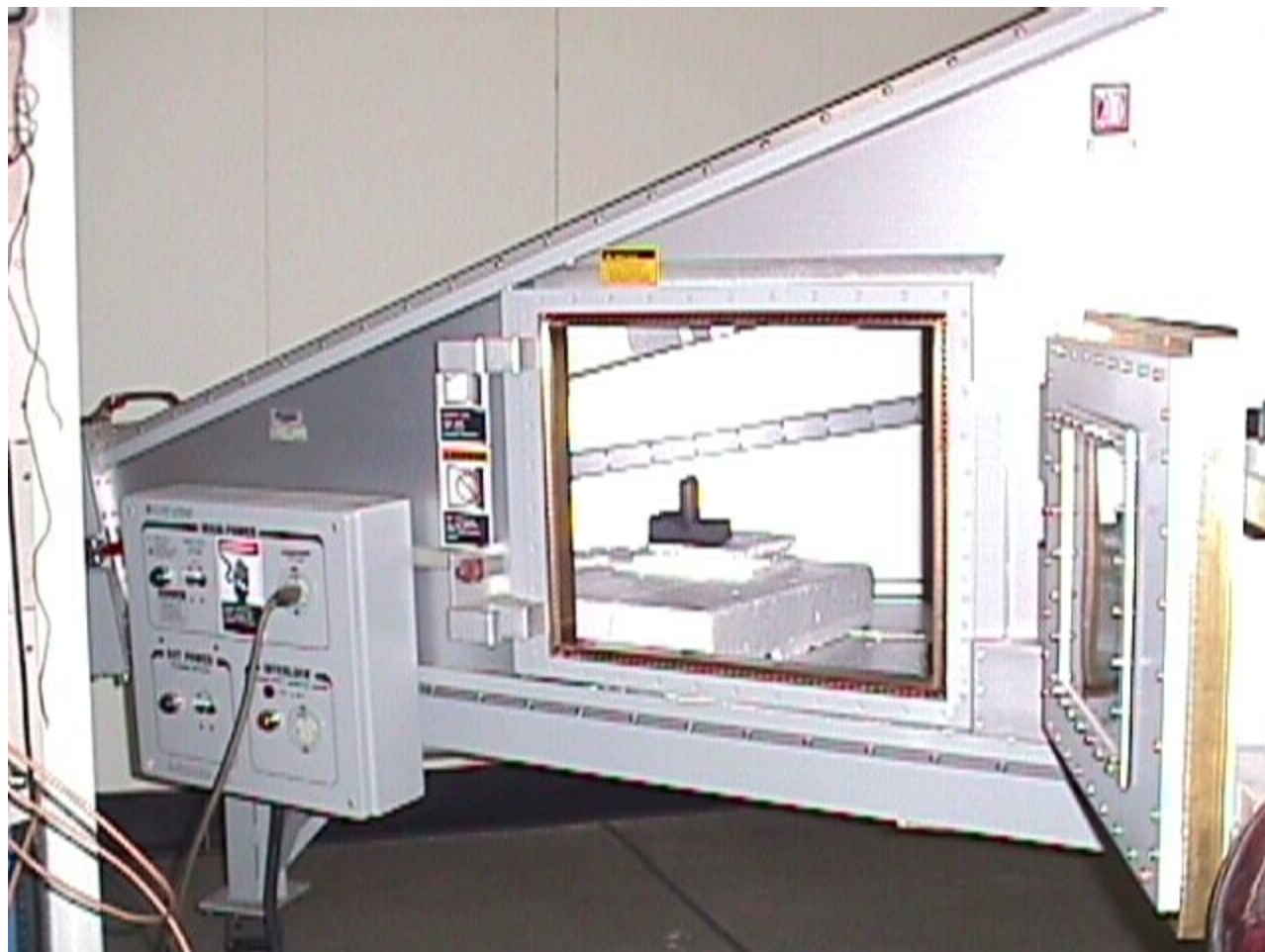
NOT APPLICABLE

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Test setup photo(s):

Radiated emissions tests



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APPENDIX

A

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Test Equipment Calibration Information

&

Test Data Sheets

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TEST EQUIPMENT CALIBRATION INFORMATION

Manufacturer	Model	Description	Serial Number	Cal Due	Interval
Hewlett Packard	8566B	MOTOROLA PPG Compliance Laboratory Spec. Analyzer SP Paging Products Group 1500 Gateway Blvd., Boynton Beach, Florida 33426 (561) 739-2179 FAX: (561) 739-2131	3014A06961	07/10/01	1 Year
Hewlett Packard	85650B	Quasi-PK Adaptor	2521A00671	07/10/01	1 Year

Hewlett Packard	85685A	Rf Preselector	2510A00192	07/10/01	1 Year
Hewlett Packard	8593 EM	EMI Analyzer	3536A00118	10/12/01	1 Year
EMCO	5305	GTEM Cell	1135	N / A	
AH SYSTEMS	SAS-200/571	Dual Ridge Horn Ant. 265		07/23/01	1 Year
EMCO	3147	Log Periodic Antenna	9311-1124	06/22/01	1 Year
Compliance Design	B-100	Biconical Antenna	385	07/21/01	1 Year
Hewlett Packard	8347A	Preamplifier	3307A01225	07/10/01	6 mos.
Hewlett Packard	8449B	Preamplifier	3008A00535	07/05/01	6 mos.
Hewlett Packard	8447D	Preamplifier	2944A07577	04/13/01	6 mos.
Hewlett Packard	83006A	Preamplifier	3950M00131	05/06/01	6 mos.

<u>Freq.</u>	<u>Spec Limit</u>	<u>Peak</u>	<u>QP / Avg.</u>	<u>Height / Pol.</u>	<u>Azm (°)</u>	<u>Corr. Factor*</u>	<u>Level</u>
(MHz)	(dBµV / m)	(dBµV)	(dBµV)	(cm)		(dB / M)	

149.9	43.5			100 / V	-----	-----	29.7
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Peak readings: Resolution and video bandwidths set to 1 MHz

APPENDIX

System Under Test Description

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SYSTEM COMPONENTS

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DEVICE TYPE: EUT, MOTOROLA VHF Scriptor Jazz 200

The device was operated in a normal operating mode with the battery saver feature (strobe) defeated. It is internally powered by a 1.5 V battery.

INTERFACE CABLES

NONE

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AC LINE CORD

NONE

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APPENDIX

C

Measurement Protocol

The test methodology followed during the collection of the data included within this technical brief was ANSI C63.4:1992 and PPG Compliance Laboratory EUT Measurement Procedure Rev 1.0.

The EUT was powered by a 1.5 V battery during the collection of the data included within.

The EUT was tested in the GTEM cell under the control of the TILE software package. The TILE software scans the unit over a specific frequency range and measures the peak voltages on the EMC analyzer. This is repeated for all three axis of the device under test. A vector summation predicts the maximum voltage phasor for each emission.

After the gain of the preamp and the cable losses are taken into account, the software uses the GTEM equations to calculate what the equivalent current into an isotropic dipole would be to produce the emission levels measured during the scans. The software then substitutes in the isotropic source excited by the equivalent current into the equations for the perfect open area test site (both horizontal and vertical equations) for the specified distance and height scan. The maximum results from the calculations are the maximum emissions in dB μ V/m.

This software has been proven to correlate with the open-area test site and the GTEM is accepted by the FCC (Ref. # 1300F2) and Industry Canada (Ref. # IC 3254 GTEM).

The data is compared to the FCC Class B limits and the worst case levels are reported in the data tables.

PLEASE HAVE A COMPANY OFFICIAL REVIEW THIS REPORT AND SIGN
